



# **Enterprise PI System Deployment: Rapidly adopting Asset Framework**

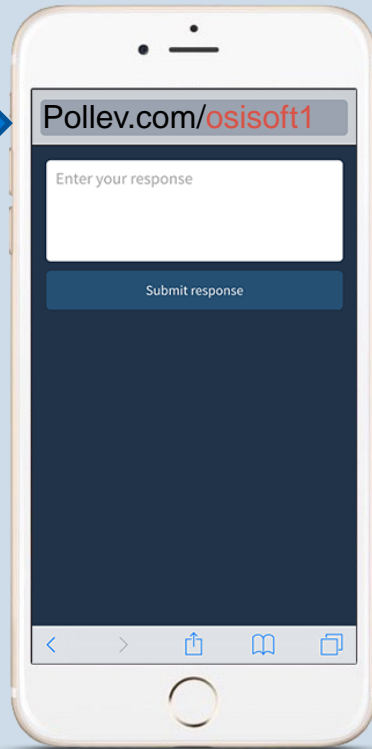
Presented by    Husain Al-Shaikh – Systems Engineer  
Chris Coen – Product Manager  
Tom LeBay – Product Manager

# Agenda

- PI Asset Based Example Kits
- Transformation of AF models
- Your response to Asset Based systems

# Responding to Poll

*Web voting*



*Text voting*



# How heavy is the "Big Ben" bell?



5 ton

7 ton

10 ton

12 ton

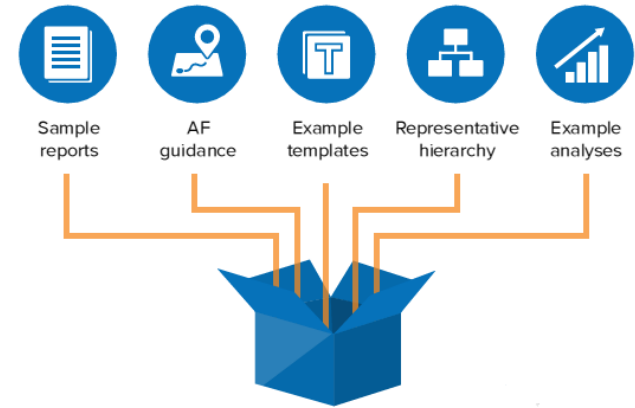


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# PI Asset Based Example Kits

- **What** is an Example Kit?
- **Why** should I use it?
- **Where** can I find it?
- **How** to use it?



# An example kit is a learning tool and a starting point for AF.



- Focus is on **solving a business problem** with AF
- Broadly applicable to **one or more industries**
- **Simple implementation** of common uses of AF

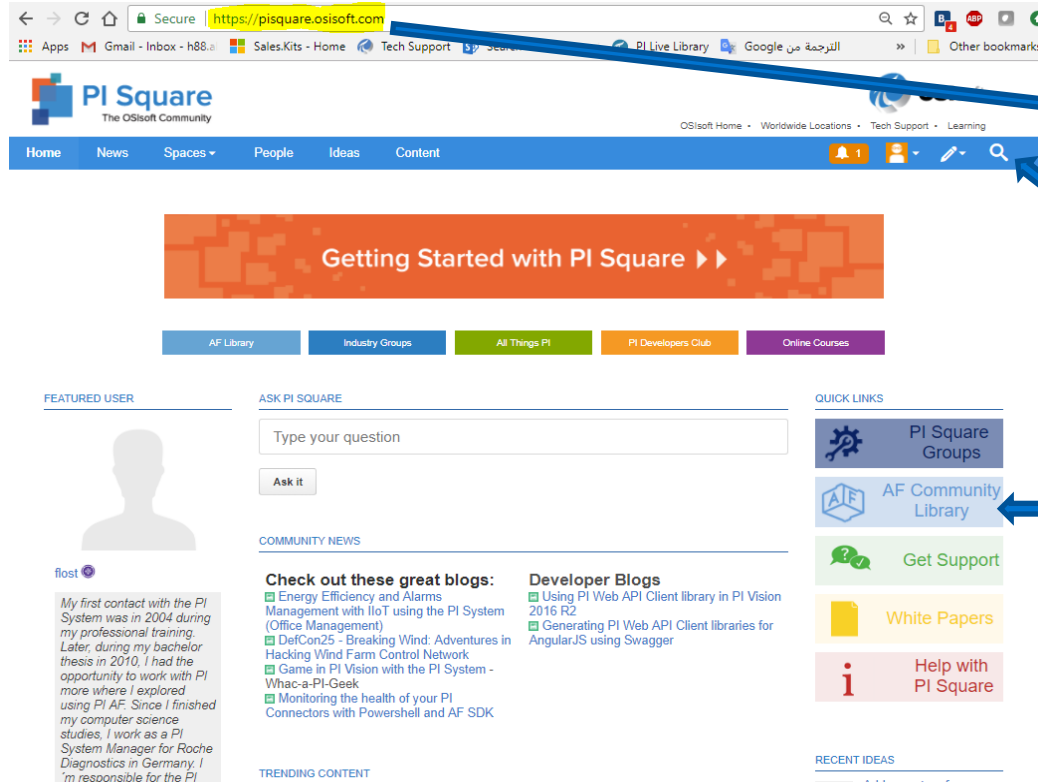
# Asset Based Example Kits VISION

The goal of the AF Community Library is to *encourage* and *empower* members of the OSIsoft community *to explore, share, and collaborate* on tools and ideas for *solving business problems with asset-based PI*.

The screenshot displays the OSIsoft VISION software interface. On the left, the 'Elements' tree shows a hierarchy of assets, including 'Houston' and 'Cracking Process'. The main window displays the details for asset 'H-230'. The 'General' tab is active, showing a table of attributes and their values. The table is organized into categories: 'Excluded attributes are hidden', 'Energy Savings KPI', 'Energy Savings Targets', 'Identification', 'PI Tag Names', 'Real-Time Data', and 'Specifications'.

| Category                       | Attribute         | Value                |
|--------------------------------|-------------------|----------------------|
| Excluded attributes are hidden | Feedrate Tag      | PD:BWHL.L            |
| Excluded attributes are hidden | Process Feedrate  | 40                   |
| Energy Savings KPI             | Fuel Savings      | 7.7743848164876344   |
| Energy Savings Targets         | Fuel(2007)        | 225                  |
| Energy Savings Targets         | FuelTarget        | 220.5                |
| Identification                 | Asset Name        | Feed No. 2           |
| Identification                 | Installation Date | 3/12/1956 5:00:00 AM |
| Identification                 | Plant             | Houston              |
| Identification                 | Process           | Cracking Plant       |
| PI Tag Names                   | Fuel Gas Flow Tag | FGTK1TMP             |
| Real-Time Data                 | Fuel              | 207.50763416290283   |
| Real-Time Data                 | Fuel Gas Flow     | 8.30030536651611 A   |
| Specifications                 | Burners           | XG-65                |
| Specifications                 | Manufacturer      | Hot Spot             |
| Specifications                 | Model             | W-514                |

# Easy Access to Asset Based Example Kits from PI Square



1.  
<https://pissquare.osisoft.com>

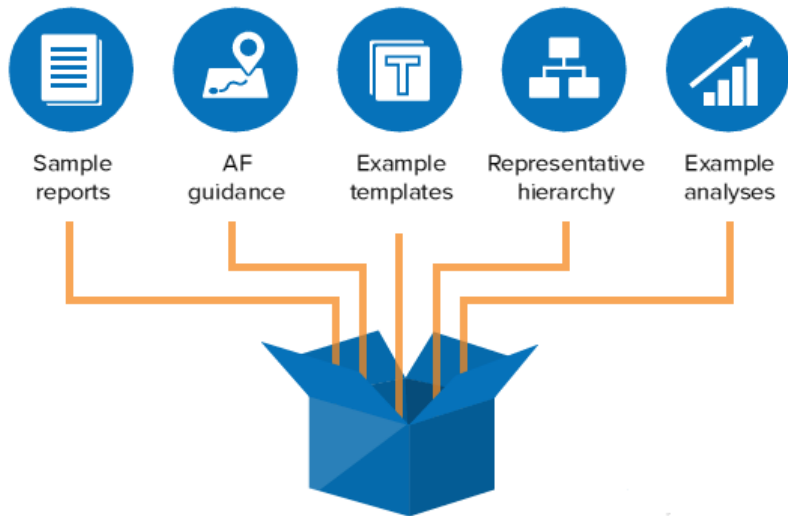
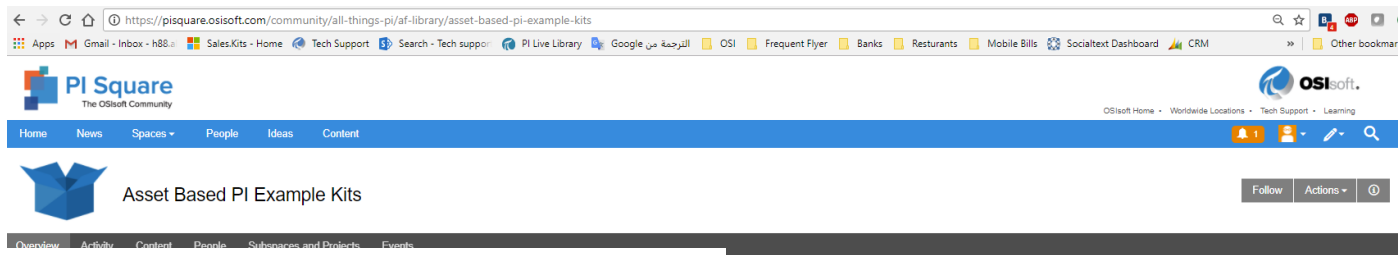
Or you can just search for  
asset based example kits

2. Click here and  
select Subspaces  
and Projects

3. Click on the Asset Based  
PI Example Kits



# Each kit is coming with guide files & video



## 1. Download

**WHAT DO I NEED TO SET UP AN EXAMPLE KIT?**

You will need access to a PI AF Server and at a minimum, permissions to create an AF database. Each kit user guide contains information on the required software versions, which range from PI AF Server 2014 R2 with PI Analysis Service 2014 R2 to PI AF Server 2015 R2 with PI Analysis Server 2015 R2. PI Data Archive 2012 is also a minimum requirement.

Watch this video to learn how the kits are installed. [Getting Started with an Asset Based PI Example Kit](#)

**WHERE CAN I GET THE KITS?**

The example kits are available to all customers and partners and can be found using the document pages below. They can also be found on the Tech Support Download Center.

**PUBLISHED EXAMPLE KITS**

Items tagged with asset based pi example kit, asset based pi example kits

- [Asset Based PI Example Kits - Calendar Techniques](#)
- [Asset Based PI Example Kit for Pump Condition Based Maintenance](#)
- [Asset Based PI Example Kit for Distillation Operation](#)
- [Asset Based PI Example Kit for Utilities Cost Management](#)
- [Asset Based PI Example Kit for Transmission & Distribution Substation Transformer Monitoring](#)

# Straight Forward Procedure

|                          |  |                    |             |          |
|--------------------------|--|--------------------|-------------|----------|
| ↑ > Example Kits         |  |                    |             |          |
| <input type="checkbox"/> | Name   | Date modified      | Type        | Size     |
|                          | Asset Based PI Example Kit for Pump CBM                              | 5/22/2017 12:01 AM | File folder |          |
|                          | Asset_Based_PI_Example_Kit_Condition_Monitoring_v2016                | 2/16/2017 4:46 PM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_Distillation_Column_Operation_v2016       | 5/21/2017 1:31 PM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_Mobile_Asset_Performance_Monitoring_v2016 | 5/16/2016 3:46 PM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_O&G_Well_Downtime_Tracking_v2015A         | 3/30/2016 9:26 AM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_O&G_Well_Drilling_and_Completion_v2015    | 5/16/2016 3:37 PM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_Reactor_OEE_v2016                         | 2/9/2017 4:10 PM   | File folder |          |
|                          | Asset_Based_PI_Example_Kit_T&D_Feeder_Voltage_Monitoring_v2015       | 3/30/2016 9:26 AM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_Uilities_Cost_Management_v2016            | 3/3/2016 2:10 PM   | File folder |          |
|                          | Asset_Based_PI_Example-Kit_PowerGen_Load_Forecasting_v2015           | 7/6/2017 3:14 PM   | File folder |          |
|                          | Tanks Inventory  | 3/29/2017 3:41 PM  | File folder |          |
|                          | Asset_Based_PI_Example_Kit_Condition_Monitoring_v2016                | 8/7/2016 4:20 PM   | ZIP File    | 1,401 KB |
|                          | Asset_Based_PI_Example_Kit_Distillation_Column_Operation_v2016       | 5/14/2017 4:28 PM  | ZIP File    | 2,838 KB |
|                          | Asset_Based_PI_Example_Kit_Mobile_Asset_Performance_Monitoring_v2016 | 4/12/2016 12:39 PM | ZIP File    | 2,610 KB |
|                          | Asset_Based_PI_Example_Kit_Reactor_OEE_v2016                         | 8/7/2016 4:22 PM   | ZIP File    | 1,127 KB |

## 2. Extract

# Each Example Kit has a User Guide File

ProcessBook Display.pdi

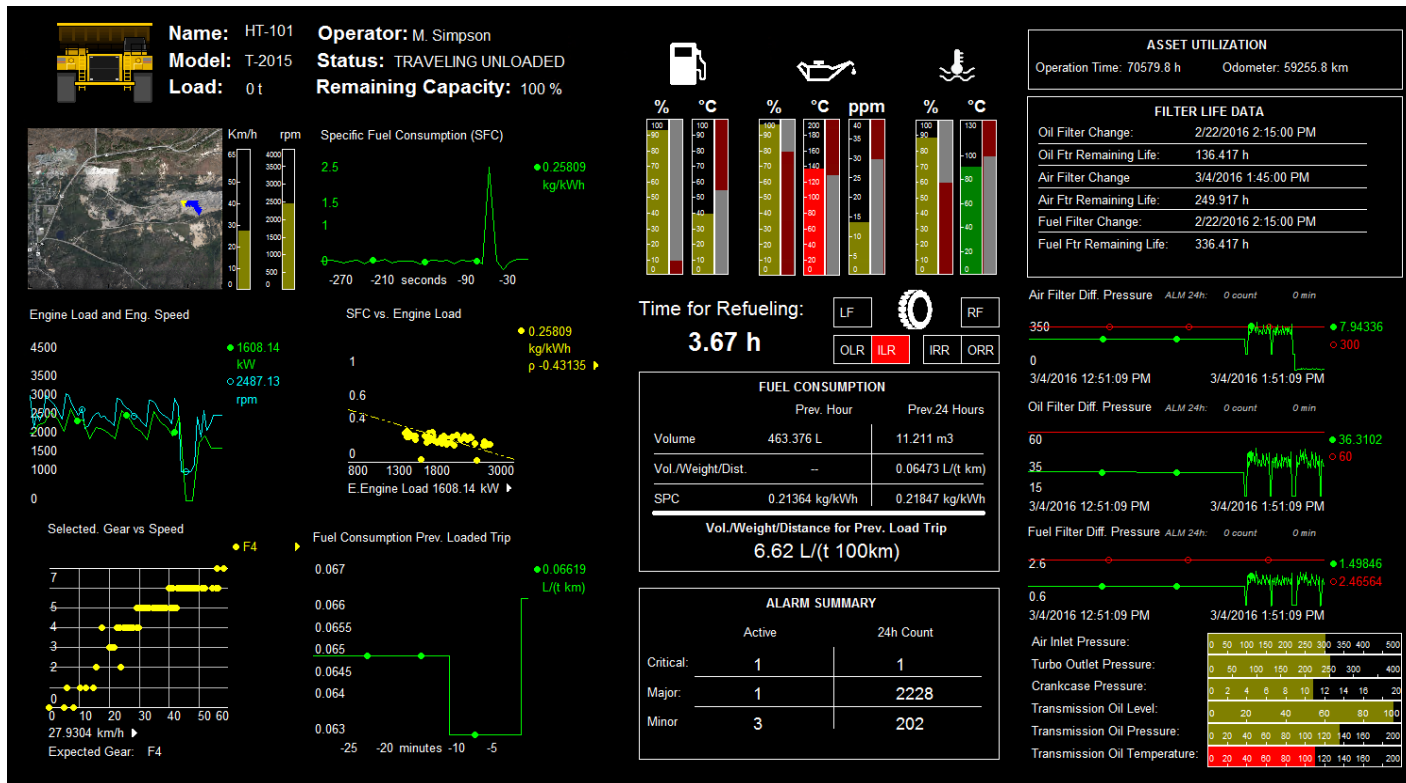
| Name  | Date modified     | Type                | Size     |
|---|-------------------|---------------------|----------|
| MMM_Haul_Truck_Performance_Monitoring.pdi                 | 3/9/2017 1:32 PM  | PI Display Docum... | 2,854 KB |
| OSIDemo_BASIC_MMM_Mobile_Asset_Performance_Monitoring.xml | 3/30/2016 8:00 AM | XML File            | 344 KB   |
| OSIDemo_FULL_MMM_Mobile_Asset_Performance_Monitoring.xml  | 3/30/2016 8:02 AM | XML File            | 438 KB   |
| UOM_Mass_Per_Energy.xml                                   | 3/30/2016 6:50 AM | XML File            | 2 KB     |
| UOM_Volume_Per_Distance.xml                               | 3/30/2016 6:50 AM | XML File            | 3 KB     |
| UOM_Volume_Per_Mass_Per_Distance.xml                      | 3/30/2016 6:50 AM | XML File            | 3 KB     |
| User Guide .pdf   | 3/30/2016 8:30 AM | Adobe Acrobat D...  | 970 KB   |

Unit of Measures.xml

DataBase.xml

User Guide.pdf

# ProcessBook Display from an Example Kit

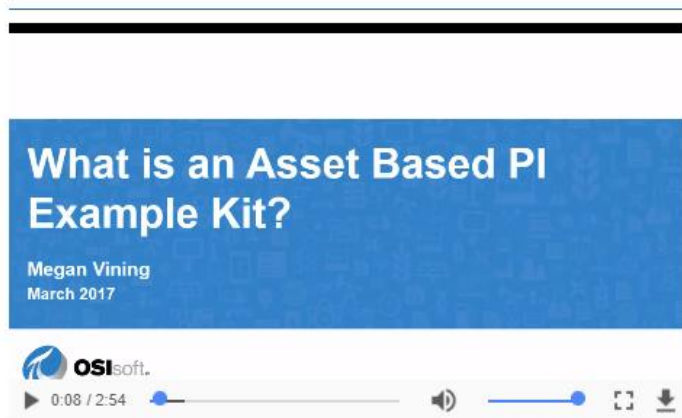


## Video for Each Kit

<https://pisquare.osisoft.com>



INTRODUCTION TO THE ASSET BASED PI EXAMPLE KITS



use case,

Kit

# Examples Kits download are increasing rapidly



## Asset Based PI Example Kits

Number of Downloads

5179

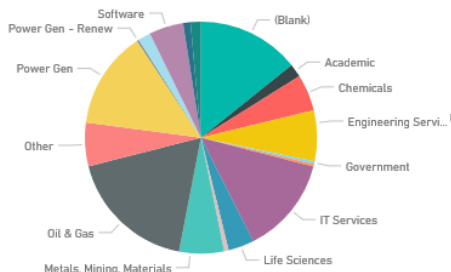
Last Update

April 17, 2017

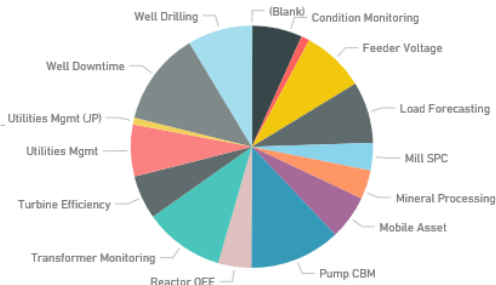
Is OSIsoft employee?

■ No  
□ Yes

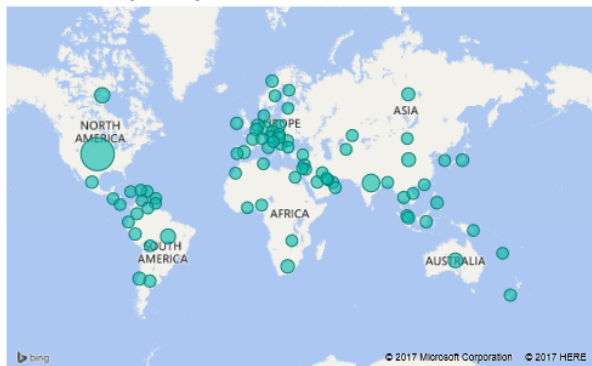
Kit Downloads by Industry



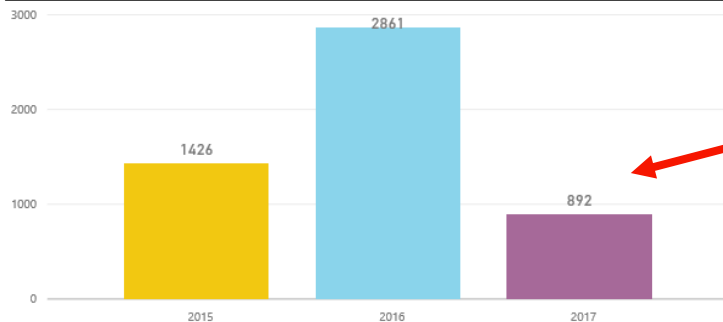
Downloads by Kit



Kit Downloads by Country



Kit downloads over time (drill down or expand for quarter and month)



April 2017

# Examples Kits download are increasing rapidly



## Asset Based PI Example Kits

Number of Downloads

6769

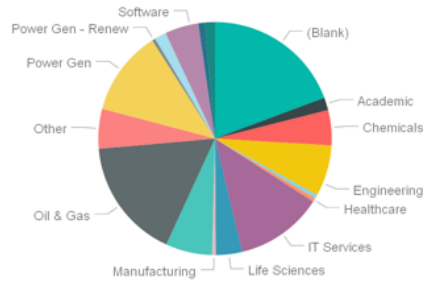
Last Update

September 25, ...

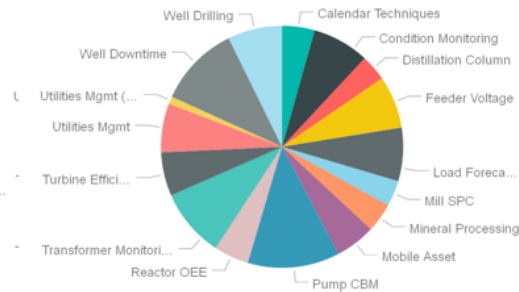
Is OSIssoft employee?

■ No  
□ Yes

Kit Downloads by Industry



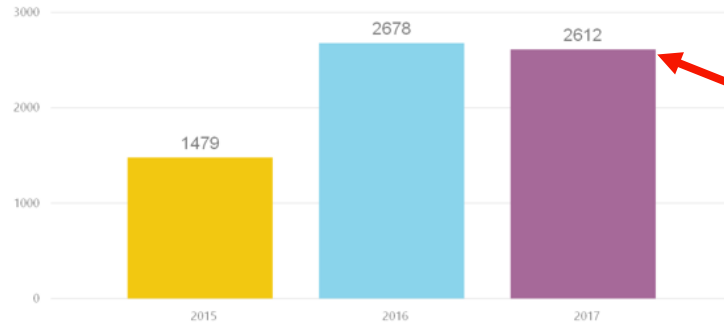
Downloads by Kit



Kit Downloads by Country



Kit downloads over time (drill down or expand for quarter and month)



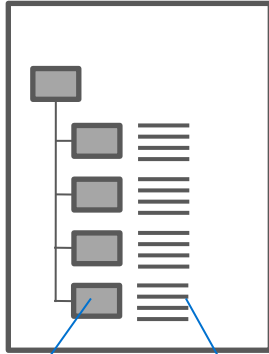
Sep 2017

# Transform AF models

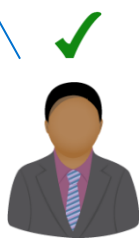


# First AF model satisfies a need

AF model

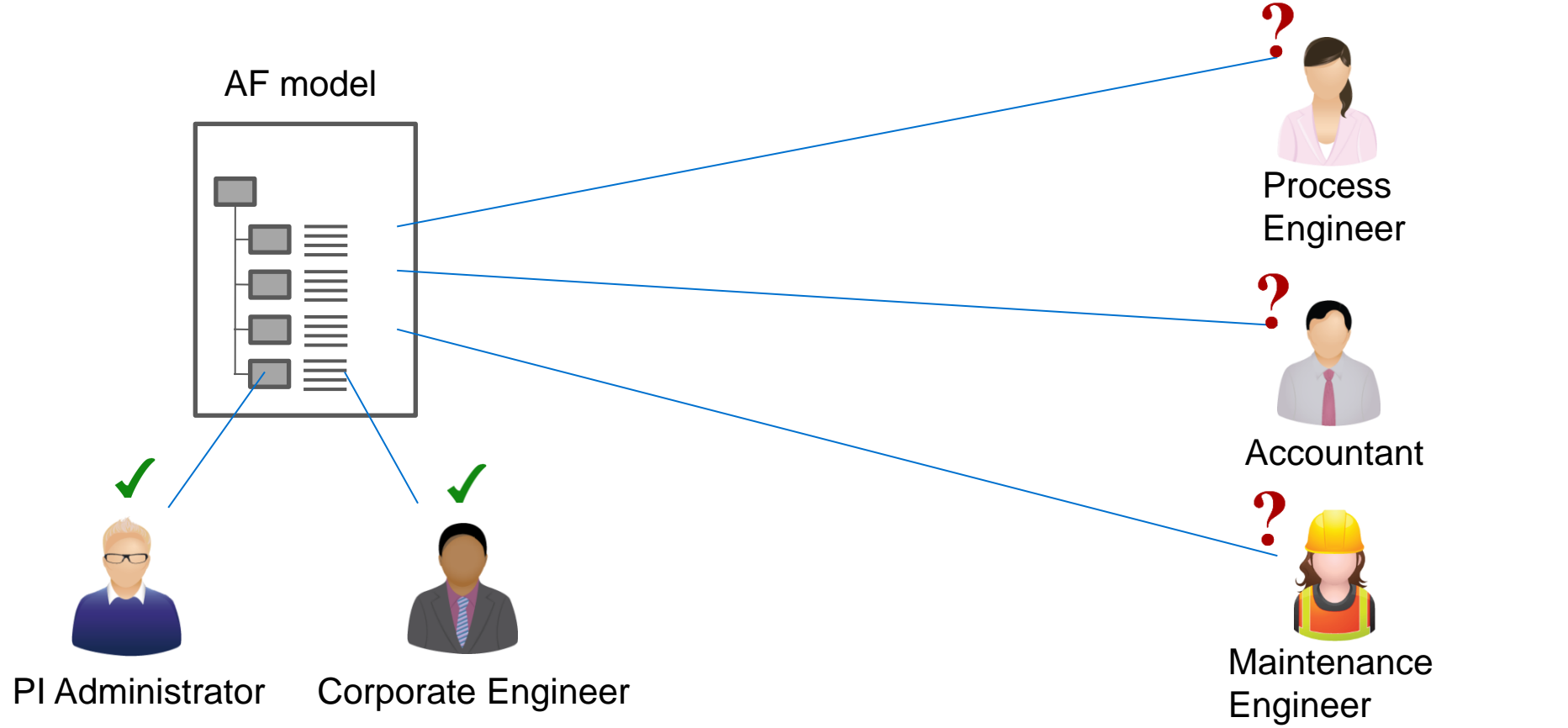


PI Administrator

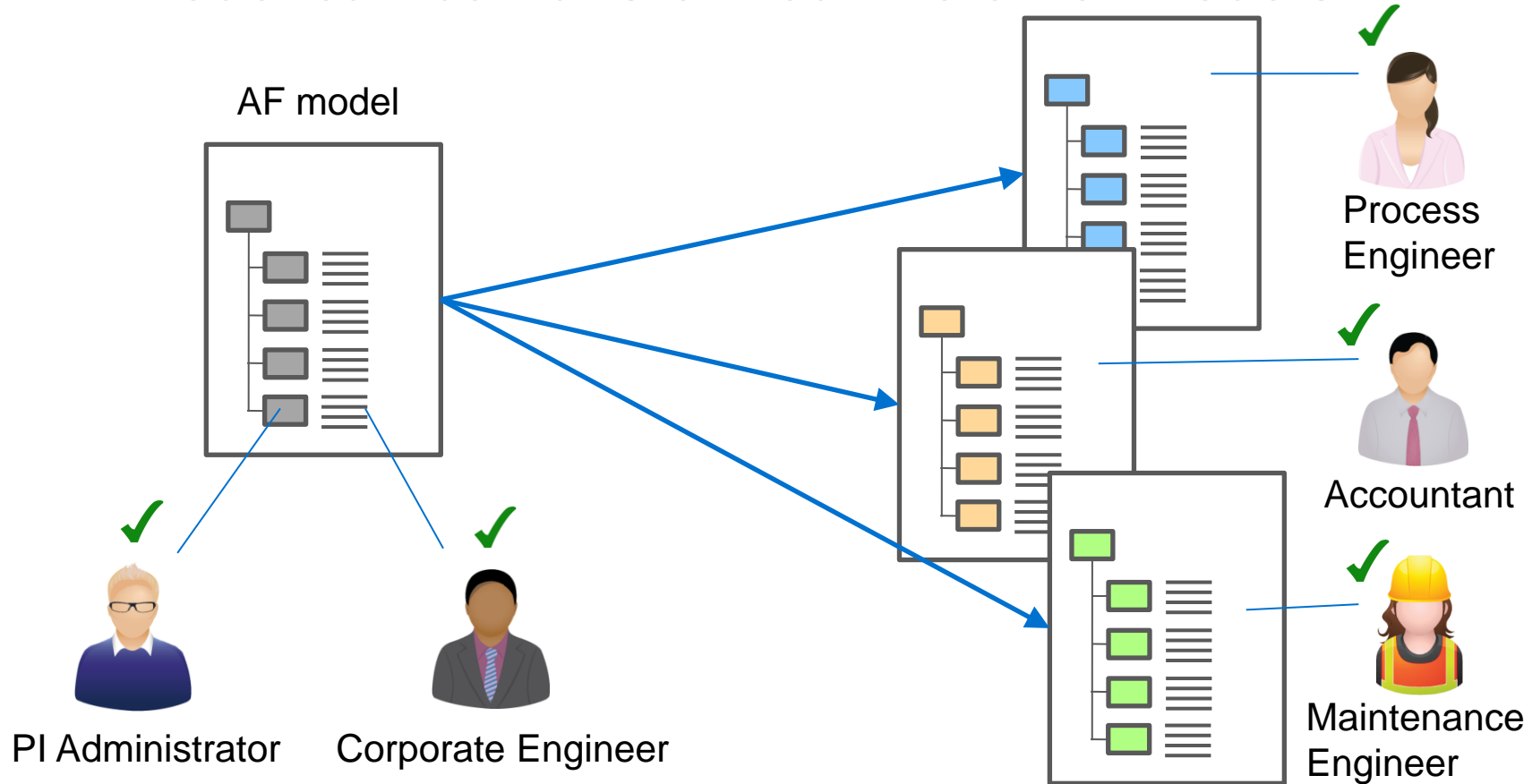


Corporate Engineer

# Other users may have different needs



# AF model can be transformed into other models



# Introducing AF Transformer

- Transforms source AF model into one or more destination models
  - Searches for data in source AF via a shape
  - Specify output shape
  - Write data to destination AF
- Configuration via XML scripting. Best suited for technical or development role



# Example: Electrical Distribution



Substations



Feeders



Transformers



Meters

# AF reference model for meters

Elements

1ND000000001

General Child Elements Attributes Ports Analyses Notification

Filter

Group by: ☐ Category ☐ Template

| Name                 | Value                 |
|----------------------|-----------------------|
| Average_voltage      | 98.4308853            |
| CustomerBillingCycle | 101                   |
| Delivered_kVARh      | 98.4308853            |
| Delivered_kWh        | 98.4308853            |
| DeviceStatus         | Active                |
| FeederCode           | 12222                 |
| MacAddress           | 00:13:50:01:01:0c:... |
| Manufacturer         | GE                    |
| ManufacturerModel    | I210+C                |
| MeterMode            | TOU                   |
| MeterProgramId       | 1884                  |
| OperationalStatus    | Active                |
| PremiseId            | 202638080001          |
| Received_kWh         | 98.4308853            |
| SerialNumber         | 350020130             |
| ServicePointId       | 202638080001          |
| StartingLoadClass    | 200                   |
| Substation           | 1000                  |
| Transformer          | 7000080001            |

Elements

Connectors

Meter\_Connector

1ND000000001

1ND000000002

1ND000000003

1ND000000004

1ND000000005

1ND000000006

1ND000000007

1ND000000008

1ND000000009

1ND000000010

1ND000000011

1ND000000012

1ND000000013

1ND000000014

1ND000000015

3KD000000001

3KD000000002

3KD000000003

3KD000000004

3KD000000005

3KD000000006

3KD000000007

KZD000000001

KZD000000002

Event Frames

Library

Unit of Measure

Contacts

Management

Substation

FeederCode

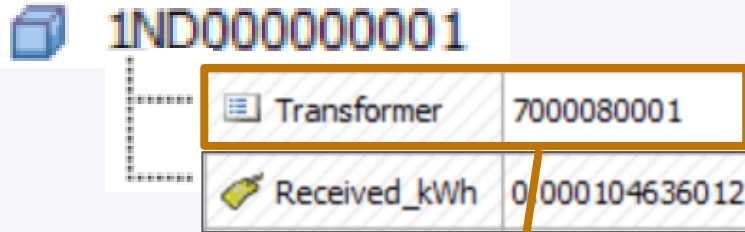
Transformer

Meter




# Transform AF models using XML script

Source AF DB



|               |              |                |
|---------------|--------------|----------------|
| 1ND0000000001 | Transformer  | 7000080001     |
|               | Received_kWh | 0.000104636012 |

Target AF DB



|                        |              |                |
|------------------------|--------------|----------------|
| Transformer_7000080001 | Received_kWh | 0.000104636012 |
|------------------------|--------------|----------------|

AF Transformer configuration

Search Shape

```
<ShapeAttribute ID="11"  
...  
  <AttributeFilter  
    Name="Transformer"/>
```

Output Shape

```
...  
<Element Name="Transformer_[11.Value]">  
...
```

# AF Transformer demo



\\ASSET-TRANS\MeterDb - PI System Explorer (Administrator)

File Search View Go Tools Help

Database Query Date Refresh New Element New Attribute Search Elements

Elements

Elements Connectors Meter\_Connector

1ND000000001

General Child Elements Attributes Ports Analyses Notification Rules Version

Filter

Group by: ☒ Category ☐ Template

| Name                     | Value                   | Settings...             |
|--------------------------|-------------------------|-------------------------|
| Category: Location       |                         |                         |
| FeederCode               | 12222                   |                         |
| Substation               | 1000                    |                         |
| Transformer              | 7000080001              |                         |
| Category: RealTime Data  |                         |                         |
| Average_voltage          | 79.84074                | \\ASSET-TRANS\\SINUSOID |
| Delivered_kVARh          | 79.84074                | \\ASSET-TRANS\\SINUSOID |
| Delivered_kWh            | 79.84074                | \\ASSET-TRANS\\SINUSOID |
| Received_kWh             | 79.84074                | \\ASSET-TRANS\\SINUSOID |
| Category: Specifications |                         |                         |
| CustomerBillingCycle     | 101                     |                         |
| DeviceStatus             | Active                  |                         |
| MacAddress               | 00:13:50:01:01:0c:d1:d4 |                         |
| Manufacturer             | GE                      |                         |
| ManufacturerModel        | 1210+C                  |                         |
| MeterMode                | TOU                     |                         |
| MeterProgramId           | 1884                    |                         |
| OperationalStatus        | Active                  |                         |
| PremiseId                | 202638080001            |                         |
| SerialNumber             | 350020130               |                         |
| ServicePointId           | 202638080001            |                         |
| StartingLoadClass        | 200                     |                         |
| VoltageType              | 240                     |                         |

Transformer

\\ASSET-TRANS\Meter\_TargetDb\_example - PI System Explorer (Administrator)

File Search View Go Tools Help

Database Query Date Refresh New Element New Attribute Search Elements

Elements

Elements Meters by Manufacturer Meters by Substation Substation\_1000 Feeder\_12222 Transformer\_7000080001

1ND000000001

General Child Elements Attributes Ports Analyses Notification Rules Version

Filter

Group by: ☐ Category ☐ Template

| Name                 | Value                   | Settings...             |
|----------------------|-------------------------|-------------------------|
| Average_voltage      | 50.3422                 | \\ASSET-TRANS\\SINUSOID |
| CustomerBillingCycle | 101                     |                         |
| Delivered_kVARh      | 50.3422                 | \\ASSET-TRANS\\SINUSOID |
| Delivered_kWh        | 50.3422                 | \\ASSET-TRANS\\SINUSOID |
| DeviceStatus         | Active                  |                         |
| FeederCode           | 12222                   |                         |
| MacAddress           | 00:13:50:01:01:0c:d1:d4 |                         |
| Manufacturer         | GE                      |                         |
| ManufacturerModel    | 1210+C                  |                         |
| MeterMode            | TOU                     |                         |
| MeterName            | 1ND000000001            |                         |
| MeterProgramId       | 1884                    |                         |
| OperationalStatus    | Active                  |                         |
| PremiseId            | 202638080001            |                         |
| Received_kWh         | 50.3422                 | \\ASSET-TRANS\\SINUSOID |
| SerialNumber         | 350020130               |                         |
| ServicePointId       | 202638080001            |                         |
| StartingLoadClass    | 200                     |                         |
| Substation           | 1000                    |                         |
| Transformer          | 7000080001              |                         |
| VoltageType          | 240                     |                         |

Element Searches

Elements

Event Frames

Library

Unit of Measure

Contacts

Management

1ND000000001 Modified:10/2/2017 5:23:18 PM. Version: 1/1/1970 12:00:00 AM, Revision 1

# Multiple models from one. Equipment by reference.

Elements

001

002

003

004

005

006

007

Element Searches

001

GeneralChild ElementsAttributesPorts

Filter

Name

Acquisition Date

Area

Building

Business Area

Enterprise

Equipment Description

Equipment Number

Equipment Status

Location

Manufacturer of Asset

Model Number

Superior Equipment

Unit

Elements

Cybertron Inc

Business Area 1

Location N

Unit1

Area 1

EquipmentA-001

Area2

Area3

Unit2

Equipment by Building

A

EquipmentA-001

C

D

N

Equipment by Manufacturer

Megatron

hg0002

XYZ

Ultra Magnus

000984567

EquipmentA-001

A56783

N45

V23

Element Searches

EquipmentA-001

GeneralChild ElementsAttributesPortsAnalysesNotification R

Filter

NameValue

Acquisition Date2017-05-17 11:28:29

AreaArea 1

BuildingA

Business AreaBusiness Area 1

EnterpriseCybertron Inc

Equipment DescriptionEquipmentA

Equipment Number001

Equipment StatusActive

LocationLocation N

Manufacturer of AssetUltra Magnus

Model Number000984567

Superior Equipment

UnitUnit1

# Sensor-based source model transformed

The screenshot displays the OSIsoft InRoads software interface, showing the transformation of a sensor-based source model. The left pane shows a tree of elements, with 'F100\_IW01\_PLN' and 'F100\_IW01\_PTUB' circled. The middle pane shows a detailed view of 'F100 IW01' with its hierarchy. The right pane shows the 'Attributes' tab for 'F100 IW01' with a table of properties.

**Elements**

- Elements
  - Connectors
    - Well\_Connector
      - Site1.F100\_IW01
        - F100\_IW01\_PLN**
        - F100\_IW01\_PTUB**
      - Site1.F100\_IW02
      - Site1.F100\_IW03
      - Site1.F100\_IW04
      - Site1.F100\_IW05
      - Site1.F100\_IW06
      - Site1.F100\_IW07
      - Site1.F100\_IW08
      - Site1.F100\_IW09
      - Site1.F100\_IW10
      - Site1.F100\_IW11
      - Site1.F100\_IW12
      - Site2.F200\_IW13
      - Site2.F200\_IW14
      - Site2.F200\_IW15
      - Site2.F200\_IW16

**F100 IW01**

- Elements
  - Regions
    - BasinA
      - Site1
        - IW
          - F100 IW01**
          - F100 IW02
          - F100 IW03
          - F100 IW04
          - F100 IW05
          - F100 IW06
          - F100 IW07
          - F100 IW08
          - F100 IW09
          - F100 IW10
          - F100 IW11
          - F100 IW12
- Element Searches

**F100 IW01**

General Child Elements Attributes Ports Analyses Notification Rules

Filter

|                                     | Name                  | Value                |
|-------------------------------------|-----------------------|----------------------|
| <input checked="" type="checkbox"/> | Basin                 | BasinA               |
| <input checked="" type="checkbox"/> | Description           | F 100 IW01           |
| <input checked="" type="checkbox"/> | Instrumentation Level | 1                    |
| <input checked="" type="checkbox"/> | Line Pressure         | 99.2187118530273 psi |
| <input checked="" type="checkbox"/> | Status                | Active               |
| <input checked="" type="checkbox"/> | tag                   | sinusoid             |
| <input checked="" type="checkbox"/> | Units                 | psi                  |
| <input checked="" type="checkbox"/> | Site                  | Site 1               |
| <input checked="" type="checkbox"/> | Tubing Pressure       | 3.35476279258728 psi |
| <input checked="" type="checkbox"/> | Type                  | IW                   |

# Roadmap for the AF Transformer

- First release 4Q 2017 – with limited distribution
  - Runs manually or as Windows scheduled task
  - Transforms defined using XML script
  - Examples included
- Second release 2018 – general availability
  - Runs as service and updates automatically

# Enterprise Asset Management

# Improved enterprise deployment of the PI System



*We need a **reliable and effective process** to seamlessly **promote and replicate** operational assets and data, so that **process models and best practices** are shared throughout the enterprise.*

## What approach do you use to organize your PI data today?

Only tag naming convention

Tag name and some PI AF structure

All PI AF structure

Other meta data system

None of the above/don't know

**Start the presentation to activate live content**

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# Other type of contextual systems help you organize your Operational

Enterprise Asset Management  
Systems (SAP PI, Maximo, etc.)

Control Systems/DCS

None

Other

**Start the presentation to activate live content**

If you see this message in presentation mode, install the add-in or get help at [PollEv.com/app](https://PollEv.com/app)



# From what you saw today, how likely are you to use the AF Transform

Very likely. How can I start now?

Likely, I need to plan a few use cases

Not likely. Maybe in the future

I do not expect to use a tool like that

**Start the presentation to activate live content**

If you see this message in presentation mode, install the add-in or get help at [PollEv.com/app](https://PollEv.com/app)

# What use cases for AF Transformer apply to you and your organization

API Connector reference models to fit into my AF model

A site or plant model so it fits the corporate standard

Corporate standard model to something usable by the site or plant

A shape usable by certain business applications (like OEE or CBM)

A shape usable by specific group of users

**Start the presentation to activate live content**

If you see this message in presentation mode, install the add-in or get help at [PollEv.com/app](https://PollEv.com/app)

## Could be the most helpful to enable an enterprise wide asset based P

the efficient way to maintain your asset models  
(keeping things in sync with the real world)

Migration of existing analytics/displays to an asset  
based system

Access to qualified resource the do the work

An automated way to find similarities across assets

Other

**Start the presentation to activate live content**

If you see this message in presentation mode, install the add-in or get help at [PollEv.com/app](https://PollEv.com/app)

# What is the most compelling reason for you to adopt an asset-based PI System?

Make the PI System more manageable/scalable  
for Operations (plant engineers)

Make the data more accessible to the rest of the  
business

Help solve a specific operational objective (OEE,  
CBM, Predictive Maint., etc)

Allow the data to be more easily consumed by other  
business systems (big data project, SAP, etc.)

Other

**Start the presentation to activate live content**

If you see this message in presentation mode, install the add-in or get help at [PollEv.com/app](https://PollEv.com/app)

# Would you define success for implementing an asset based PI System in 1-2 years?

Project based asset models to support specific operations or business objectives

Developed sufficient expertise to build and maintain process models

Comprehensive asset based models for operations

Multiple models to solve operations and business problems

I don't know

Other

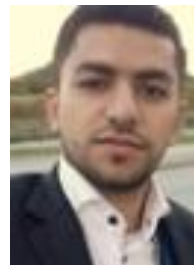
**Start the presentation to activate live content**

If you see this message in presentation mode, install the add-in or get help at [PollEv.com/app](https://PollEv.com/app)

**Husain Al-Shaikh**

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## Questions

Please wait for the **microphone** before asking your questions

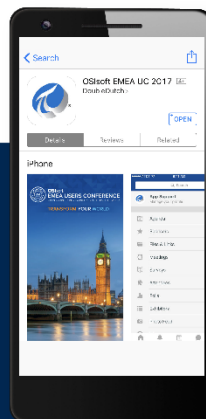


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Danke

谢谢

Merci

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**Thank You**

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Obrigado